



CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

J-3

DISTRIBUTION: A, C, and S

CJCSI 3810.01D

28 June 2013

METEOROLOGICAL AND OCEANOGRAPHIC OPERATIONS

References: Enclosure E

1. Purpose. In accordance with reference a, this instruction establishes policy and assigns responsibilities for conducting meteorological and oceanographic (METOC) operations in support of Combatant Commanders (CCDRs) and other joint activities.
2. Cancellation. CJCSI 3810.01C, 18 September 2009, is canceled.
3. Applicability. This instruction applies to the Services, unified commands, Joint Staff, and other joint activities.
4. Policy. Applicable organizations will plan and execute METOC operations in accordance with this instruction. See Enclosure A.
5. Responsibilities. See Enclosure B.
6. Summary of Changes. This change further incorporates METOC doctrinal information and concepts in reference c. This change also deletes all references made to U.S. Joint Forces Command (USJFCOM) and deletes extraneous information duplicated in Joint Publication 3-59, 7 December 2012, "Meteorological and Oceanographic Operations."
7. Releasability. This instruction/manual/notice is approved for public release; distribution is unlimited. DoD Components (to include the combatant commands), other Federal agencies, and the public may obtain copies of this instruction/ manual/notice through the Internet from the CJCS Directives Home Page--http://www.dtic.mil/cjcs_directives.

8. Effective Date. This instruction is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:



N. W. TYSON
RADM, USN
Vice Director, Joint Staff

Enclosures:

- A -- Policy
- B -- Responsibilities for METOC Operations
- C -- Joint METOC Coordination Organizations Listing
- D -- U.S. Government Policy Regarding Weather Modification
- E -- References
- GL -- Glossary

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DISTRIBUTION

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U.S. Army/HQDA DCS, G-2 DAMI-OPO
U.S. Navy/OPNAV N2/N6
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U.S. Africa Command/USAFRICOM J353 METOC
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Office of Primary Responsibility (OPR) for the subject directive has chosen electronic distribution to the above organizations via E-mail. The Joint Staff Information Management Division has responsibility for publishing the subject directive to the SIPR and NIPR Joint Electronic Library web sites.

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ENCLOSURE A

POLICY

1. The air, land, maritime, and space environments affect the ability of U.S. military forces to accomplish their mission. METOC operations are critical to a commander's awareness of the operational environment and the ability to exploit this awareness to gain an advantage during military operations. Commander's must integrate METOC information into Joint Operational Planning and decision making processes across the range of military operations to optimize the employment of military capabilities while marginalizing the benefit of the environment for the enemy, thereby creating an asymmetrical advantage for friendly forces.
2. Each combatant commander (CCDR) will designate a Senior METOC Officer (SMO) to coordinate all METOC operations within the area of responsibility (AOR) or functional responsibility. The SMO is responsible for assisting the CCDR and staff in developing and executing operational METOC service concepts in support of a designated joint force. In addition, during the initial planning for joint operations, the CCDR will designate the Joint METOC Coordination Organization (JMCO) from forces already assigned or from existing METOC forces. Enclosure C lists Service METOC units with the ability to perform duties as a JMCO.
3. Joint forces depend on timely, accurate, consistent, and relevant METOC information to plan, direct, and execute joint operations (reference d). This includes observations, analyses, prognostic data or products, and METOC integration. Inaccurate or missing METOC information can cost lives, undermine the successful execution of a mission, waste resources, and impair readiness. Non-DoD sources of METOC information are sometimes available over DoD communications channels. Joint forces should not rely on non-DoD sources of METOC information for joint operations unless determined by the METOC personnel responsible for supporting that joint force that the information is sufficiently timely, accurate, consistent, and relevant. The SMO or lead Service functional, through formal delegated authority, will determine the acceptability of specific non-DoD METOC sources.
4. U.S. military METOC forces must be capable of functioning without substantive dependence or reliance on non-DoD data or support.
5. U.S. military METOC forces must be interoperable and capable of independent operations.
6. The United States ratified the Convention on the Prohibition of Military or Other Hostile Use of Environmental Modification Techniques (ENMOD Treaty)

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in 1977. Enclosure D addresses U.S. policy with respect to environmental and weather modification.

7. U.S. military METOC forces support global military operations and requirements across the range of military operations (reference d). Some examples of the forces and operations requiring METOC support include the following:

- a. Joint Task Force (JTF) missions.
- b. Joint Force Air Component Commander (JFACC) exercising operational control over multi-Service component air forces.
- c. Joint Force Land Component Commander (JFLCC) exercising operational control over land forces.
- d. Joint Force Maritime Component Commander (JFMCC) exercising operational control over maritime forces.
- e. Joint Force Special Operations Component Commander (JFSOCC) exercising operational control over special operations forces.
- f. National-level strategic intelligence, surveillance, or reconnaissance missions.
- g. DoD space operations and worldwide communications.
- h. Joint operations in support of the Department of Homeland Security.
- i. Theater security cooperation and capacity-building operations with partner nations' METOC services.
- j. Joint operations performing Defense Support to Civil Authorities (DSCA).

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ENCLOSURE B

RESPONSIBILITIES FOR METEOROLOGICAL AND OCEANOGRAPHIC
OPERATIONS

1. The Chairman of the Joint Chiefs of Staff:

a. Assesses joint military requirements for command, control, and communications; recommends improvements; and provides guidance on aspects that relate to the conduct of joint METOC operations (reference e).

b. Coordinates with the Services, unified commanders, and USG agencies to fulfill shortfalls in METOC capabilities and meet requirements of the supported and supporting CCDRs. Services will perform this coordination when delegated.

c. Where appropriate, reviews plans (e.g. campaign plans, OPLANs, CONPLANs, etc.) to ensure adequacy, coordination, and interoperability of METOC operations, resources and activities.

d. Sponsors recurring meetings with unified command SMOs and Service METOC staff representatives to help ensure equipment, doctrine, and training resources build interoperable capabilities to ensure METOC information is discoverable on supported command and control, planning, and execution systems.

e. Sponsors the Joint METOC Board (JMB) under the Joint Staff Director of Operations to promote and develop joint METOC initiatives and to coordinate and resolve joint METOC issues. The JMB provides an authoritative forum for DoD, Joint Staff, Service, and combatant command METOC staffs to address interoperability issues.

f. Defines and establishes doctrine for all aspects of joint employment of METOC resources, including standardized guidance on release of environmental data to non-DoD agencies and allied/foreign governments.

g. Evaluates and integrates operational METOC requirements of the CCDRs and coordinates Service sponsorship (reference f).

h. Develops policy for joint METOC training, to include qualification of personnel for joint METOC billets (reference g).

i. Serves as the focal point for coordination of METOC operational support

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issues in the interagency and international arenas, unless delegated. Provides Joint Staff representation to interagency and international METOC organizations, as required, and to include the NATO Military Committee Working Group (METOC) and subordinate working groups.

j. Plans, prepares, and coordinates actions required to deny METOC information (to include direct readout of meteorological satellite data) to an adversary while retaining use of the information for U.S. and allied forces (references h and i).

k. Responsible for joint force training to include support in the development of the joint training policy (reference j).

2. Services:

a. Organize, train, equip, and provide forces bringing desired capabilities required to conduct METOC operations in support of joint operations. Services should field METOC systems that are interoperable with: (1) one another; (2) supported command and control systems; (3) allied and Coalition forces; and (4) U.S. civil agencies.

b. Plan for the continued evolution of peacetime METOC facilities, assets, support, and services to meet mobilization needs in coordination with federal agencies, Joint Staff, NOAA, or other appropriate authorities.

(1) Forward requests for NOAA assets and/or personnel to the Joint Staff.

(2) Coordinate requests for NOAA environmental data and information directly with NOAA.

c. Promote interoperability with other Services' equipment and procedures to ensure unity of effort. Where feasible, assist other Services in accomplishing METOC functions, to include coordination of research and development efforts to avoid duplication and ensure commonality in the development of METOC capabilities.

d. Provide, operate, and maintain the METOC assets, tactical equipment, and capabilities organic to their own organizations.

e. When required, U. S. Navy and U. S. Air Force will provide JMCO to support CCDR joint operations. Certain geographic AORs feature a standing JMCO capability, e.g., the 21 OWS supports USEUCOM and USAFRICOM on a daily basis. See Figures C-1 and C-2 for the assigned units charged with supporting each combatant command.

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3. Chief of Staff, U.S. Army, is responsible for:

- a. Weather sensing in direct support of U.S. Army artillery systems and for atmospheric sensing as described in USA-USAF inter-Service directives.
- b. Training and equipping U.S. Air Force meteorological personnel supporting the U.S. Army as prescribed by USA-USAF inter-Service directives.
- c. Funding U.S. Air Force meteorological operations in support of the U.S. Army as prescribed in USA-USAF inter-Service directives.

4. Chief of Naval Operations is responsible for:

- a. METOC operations in support of all elements of the U.S. Navy.
- b. Funding the development and fielding METOC equipment for the U.S. Marine Corps.
- c. Oceanographic operations in support of all elements of the Department of Defense.
- d. Precise time and astrometry for all elements of the Department of Defense.

5. Chief of Staff, U.S. Air Force, is responsible for:

- a. Meteorological operations in support of all elements of the U.S. Air Force and all elements of the U.S. Army as per USA-USAF inter-Service directives.
- b. Training of U.S. Air Force meteorological personnel to support the U.S. Army as described by USA-USAF inter-Service directives.
- c. Space environmental operations in support of all elements of the Department of Defense.

6. Commandant of the Marine Corps is responsible for:

- a. Meteorological operations in support of the Marine Air-Ground Task Force.
- b. METOC operations in support of all U.S. Marine Corps garrison activities.

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7. Combatant Commanders:

a. Designate a SMO to coordinate all METOC operations within the AOR or functional responsibility. The SMO will be assigned to a joint billet on the unified command staff to most effectively integrate joint METOC operations and to coordinate component METOC capability requirements. The SMO should be primarily tasked for METOC-related duties and functions.

b. Assign METOC tasks to, and direct coordination among, the components to ensure unity of effort. Tailor joint METOC operations to ensure a variety of options in response to any crisis. Options must be sufficiently agile to accommodate the uncertainties associated with the transition from a peacetime posture to crisis response.

c. During the initial planning for joint operations:

(1) Designate and task a JMCO from forces already assigned in the AOR, and/or from the existing METOC operations support community (MOSC). Enclosure C lists Service METOC units with the ability to perform duties as a JMCO.

(2) Request additional METOC capability as required to meet the Joint Force Commander's (JFC's) METOC requirements.

d. Integrate environmental information during the planning and execution of all operations.

e. Coordinate with U.S. diplomatic missions, senior headquarters, allied or Coalition forces, and other U.S. agencies, as required, to ensure all available METOC information and systems, as well as indigenous assets, information, and services, are properly considered and made available for use by the joint force.

f. Develop and disseminate to the JFC and Service components a concept of operations (CONOPS) that includes METOC support to joint operations. The CONOPS should include a METOC sensing strategy and initial collection plan that leverages DoS, DoC, and other United States Government (USG) departments and agencies, as necessary, to ensure the necessary equipment and manpower are deployed to satisfy the mission requirements.

g. Plan and prepare to execute actions required to deny METOC information (to include direct readout of meteorological satellite data) to an adversary while retaining use of the information for U.S. and allied forces (reference h). Coordinate with the Joint Staff on all aspects of any plans and actions that may impact other agencies of the USG or allied or neutral nations.

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h. Collect and review after action reports and lessons learned upon completion of joint operations, incorporating lessons learned into revisions of OPLANs and CONPLANs, and providing them to the Services for future programming and planning.

8. Commander, U.S. Special Operations Command (CDRUSSOCOM) is responsible for acquiring interoperable special operations-unique METOC equipment and providing training to special operations METOC personnel that is beyond Service responsibility and capability. CDRUSSOCOM is also responsible for developing doctrine, tactics, techniques, and procedures for METOC support to special operations.

9. JFCs:

a. Establish a requirement for METOC support for the joint force by designating a Joint METOC Officer (JMO) or lead Service component to fulfill JMO responsibilities immediately upon initiation of planning.

b. Employ component METOC resources to conduct METOC operations in support of joint operations and training.

c. Provide additional METOC guidance, if necessary, to supplement the CCDR METOC CONOPS or other published guidance.

d. Direct and coordinate the activities of all METOC assets under operational control to ensure unity of effort in accomplishing assigned missions.

e. Identify METOC capability requirements as well as any known shortfalls in METOC capabilities.

f. Coordinate with the appropriate CCDR for centralized METOC support or other additional support required to fulfill operational needs not within the assigned forces' capabilities.

g. Coordinate with the CCDR to designate the JMCO from the MOSC.

h. Ensure all supporting METOC forces are capable of exchanging information directly and freely with each other in a timely manner to maximize consistency of information.

i. Ensure air, land, maritime, and space environments are considered during the planning of all operations and that the JMO is included at the beginning of the planning process.

j. Plan and prepare to execute actions required to deny METOC

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information to an adversary while retaining use of the information for U.S. and allied forces.

k. Direct and guide the JMO to develop, integrate, and maintain the Joint Operations Area Forecast (JOAF) for the Joint Operations Area (JOA) and other products as required.

10. Service Components:

a. Services with organic METOC forces will provide METOC capability to combatant command Service components to conduct METOC operations in support of joint operations.

b. Through their respective Services:

(1) Provide input to assist with coordination and prioritization of research and development efforts of the individual Services to avoid duplication and ensure commonality in the development of METOC operational capabilities, as appropriate.

(2) Coordinate and, as directed by Service agreements or regulations, participate in the funding and procurement of METOC equipment, except for unique special operations forces METOC equipment (see paragraph 8), for the collection, processing, receipt, storage, and transmission of METOC data. This equipment should be configured in accordance with CJCS guidance to ensure interoperability, exploit existing inter-Service capabilities, and avoid unnecessary duplication. Where feasible, equipment should be procured from a common source to reduce costs.

c. Upon initiation of joint operation planning (reference k):

(1) Use the CDR CONOPS as guidance in developing and disseminating specific guidance for METOC operations within the Service METOC organizations.

(2) Provide component METOC support requirements to the CDR and JFC, and identify any known shortfalls in the components' ability to conduct required METOC operations.

d. Provide funding for the deployment of METOC assets and resources in support of joint training exercises and operations in which their component forces are participating.

e. Provide funding, METOC personnel, and equipment to participate in Joint Staff sponsored training, training exercises, and other training

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opportunities.

11. The SMO to the CCDR:

a. Serves as the focal point for joint force METOC support and keeps the CCDR apprised of METOC operations and conditions in the AOR.

b. Coordinates with the JMO, the Services, and other agencies for METOC support or other additional capabilities required to fulfill operational needs that are not within the components' ability to provide.

c. Develops, implements, and assists in the execution of a CONOPS for METOC support that is integrated with and complements the CCDR's CONOPS. Through the planning and execution cycles, develops an Annex H (METOC Operations) for each CCDR operations order (OPORD), OPLAN, or concept plan (CONPLAN), as appropriate (reference k). This Annex incorporates the METOC CONOPS and describes METOC operations and services within a joint force. It is the SMO's primary vehicle to provide directive guidance on tasks, responsibilities, and coordinating instructions.

d. Develops a METOC sensing strategy that leverages all possible instruments of national power to meet the CCDR's ongoing METOC situational awareness requirements. The SMO collaborates with the Service components and other agencies to build this sensing strategy, which is then included in Annex H (METOC Operations).

e. Develops an initial METOC collection plan, based on the sensing strategy, and incorporates it into Annex H (METOC Operations).

f. Obtains METOC information requirements from all joint forces, recommends assignment of METOC tasks, and coordinates with components to ensure unity of effort.

g. Participates in the JMB steering group forum as an avenue to coordinate and resolve joint METOC issues, as needed.

h. Coordinates METOC communication requirements with the CCDR's communication system directorate (J-6) and components, and assists in the development of Annex K (Communications Systems Support) of each CCDR OPORD, OPLAN, or CONPLAN, as appropriate.

i. Coordinates METOC support requirements/information needs with CCDR's J-2, Joint Intelligence Centers, and components. Provides input to the joint intelligence preparation of the operational environment, and assists in the development of Annex B (Intelligence) of each CCDR OPORD, OPLAN, or CONPLAN, as appropriate.

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j. Addresses METOC requirements for Annex N (Space Operations) of each CCDR OPOD, OPLAN, or CONPLAN, as appropriate. Coordinates with the U.S. Strategic Command SMO for nonstandard space environmental support requirements.

k. With the CCDR's approval and the aid of his staff, coordinates with the U.S. diplomatic missions, Joint Staff, other U.S. agencies and allied or Coalition forces, as required, to ensure all available METOC information and systems, including non-DoD, are properly considered and made available, if needed, for use by the joint force. Coordination should include a review of bilateral or multilateral treaties and treaty requirements where the provision of METOC information or services is concerned, as well as any memorandums of understanding with non-DoD agencies for the same purpose. Use of non-DoD assets should only add to the capability resident within U.S. military METOC operational capabilities.

l. Coordinates with the JFC, the Services, and the JMO on the requirements for the designation and augmentation of a JMCO. In cases where multiple JFCs are designated and JOAs overlap, communicates CCDR's guidance and priorities for METOC operations to de-conflict the different operations.

m. Ensures all METOC capability requirements are included in the time-phased force deployment data (TPFDD) and that METOC TPFDD requirements are validated. Through the planning, execution, and review cycle, evaluates requirements against reach-back capabilities to meet objectives outlined in OPLANs and CONPLANs.

n. Collects AARs and lessons learned upon completion of joint operations, identifies shortfalls, evaluates requirements, incorporates requirements into revisions of OPLANs and CONPLANs, and provides the revised documents to the Services for future programming and planning.

12. JMO:

a. Coordinates the JFC's METOC operations to accomplish the commander's intent via coordination and collaboration with the SMO and component METOC forces assigned or attached to the command.

b. Refer to Joint Publication 3-59 for specific JMO duties.

13. Commander, JMCO:

a. Provides direct METOC support to the JTF once the JMCO is designated in the OPORD Annex H (METOC Operations) or CCDR's authoritative plan. The JMCO should also be listed as a supporting organization to the JFC in Annex A (Organization) of the named operation's OPORD. Enclosure C lists Service METOC units capable of performing the role of JMCO.

b. Coordinates the activities of all MOSC organizations and facilitates METOC operations in support of the JTF.

c. Coordinates support requirements with the SMO/JMO. Provides support to SMO, JMO, joint force METOC components, and joint staff as required.

d. Designates or forms an element from within the JMCO, known as the JMCC, to provide support to the JTF on a day-to-day basis. The JMO will provide direction and guidance to the JMCC to synchronize and integrate pertinent METOC information in the JOA, leveraging component capabilities and virtually assembling the appropriate MOSC components to meet joint force requirements.

e. Produces the JOAF and other METOC products as required by the supported joint force, on a battle rhythm established by the JMO that supports the JFC's decision cycle. Hosts JOAF collaborative sessions. Performs quality control on the JOAF and any other products generated by the JMCC, and amends and updates products as required. Performs meteorological watch for the JOA.

f. Requests multi-service manning augmentation following the Global Force Management request process, as required, to meet the JTF mission objectives.

g. Utilizes the Annex H (METOC Operations), the METOC Letter of Instruction (LOI), and METOC CONOPS to maintain consistency and unity of effort.

h. Maximizes the use of net-centric capability and operationally-secure, web-based technology to build a virtual data warehouse of products. Typically, this can be accomplished through a METOC web page.

i. Maintains an appropriate level of situational awareness of the joint force operation, the overall objective, and specific METOC thresholds that affect joint force component operations. Incorporates the JFC's METOC thresholds that affect military capabilities and joint operations in the field.

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j. Conducts assessments of performance and effectiveness. Prepares report inputs and records lessons learned as requested by the SMO or JMO.

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ENCLOSURE C

JOINT METOC COORDINATION ORGANIZATIONS

1. The U.S. Air Force and U.S. Navy maintain forecast centers from the MOSC in support of Service-specific missions that can be designated and tasked by CDRs to execute JMCO responsibilities. The organizations listed in Figures C-1 and C-2 have the capability to perform duties as a JMCO.

FORECAST CENTERS	LOCATION	ALIGNED WITH
15th Operational Weather Squadron (OWS)	Scott AFB, IL	USNORTHCOM
17 OWS	JB Pearl Harbor-Hickam, HI	USPACOM USNORTHCOM
21 OWS	Kapaun AS, Germany	USAFRICOM USEUCOM
25 OWS	Davis-Monthan AFB, AZ	USNORTHCOM
26 OWS	Barksdale AFB, LA	USNORTHCOM
28 OWS	Shaw AFB, SC	USCENTCOM
23d Weather Squadron	Hurlburt Field, FL	USSOCOM
612th Support Squadron Operational Weather Flight	Davis Monthan AFB, AZ	USSOUTHCOM USNORTHCOM

Figure C-1. U.S. Air Force Forecast Centers

2. The U.S. Navy forecast centers are functionally aligned to support the U.S. Navy's Numbered Fleets and report to the Naval Oceanography Operations Command.

FORECAST CENTERS	LOCATION	FLEET ALIGN	CAPABILITY TO BE ALIGNED WITH
Fleet Weather Center - Norfolk	Norfolk, VA	TF80, C4F, C6F	USNORTHCOM USSOUTHCOM USEUCOM USAFRICOM
Fleet Weather Center – San Diego	San Diego, CA	C3F, C5F, C7F	USNORTHCOM USPACOM USCENTCOM
Joint Typhoon Warning Center	Pearl Harbor, HI	C3F, C5F, C7F	USNORTHCOM USPACOM
Naval Oceanography Special Warfare Center	Coronado, CA	Naval Special Warfare Command	USSOCOM

Figure C-2. U.S. Navy Forecast Centers

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ENCLOSURE D

U.S. GOVERNMENT POLICY REGARDING WEATHER MODIFICATION

1. The United States is party to an arms control treaty known as the Convention on the Prohibition of Military or other Hostile Use of Environmental Modification Techniques (ENMOD Treaty), ratified in 1980.

a. The ENMOD Treaty states that “Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long lasting, or severe effects as the means of destruction, damage, or injury to any other State Party.” Furthermore, “Each State Party to this Convention undertakes not to assist, encourage or induce any State, group of States or international organization to engage in activities contrary to the provisions of paragraph 1 of this article” (referring to the first quotation).

b. Environmental modification techniques refer to any techniques for changing (through the deliberate manipulation of natural processes) the dynamics, composition, or structure of the Earth, including its biota, lithosphere, hydrosphere, and atmosphere or of outer space.

2. The terms “widespread,” “long lasting,” and “severe” will be interpreted as follows:

a. Widespread. Encompassing an area on the scale of several hundred square kilometers.

b. Long lasting. Lasting for a period of months or approximately a season.

c. Severe. Involving serious or significant disruption or harm to human life, natural and economic resources, or other assets.

3. The United States occasionally receives requests for assistance with weather modification operations in foreign nations, some of which are proposed initially to U.S. military commands or agencies located in those nations. In the event that foreign nations or international organizations request assistance with weather modifications, they should be informed to forward their request through diplomatic channels to the Department of State. No encouragement or commitment should be indicated by the receiving military organization.

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ENCLOSURE E

REFERENCES

- a. DoDI 5100.73, 1 December 2007, "Major Department of Defense Headquarters Activities"
- b. Joint Publication 2-01.3, 16 June 2009, "Joint Intelligence Preparation of the Operational Environment"
- c. Joint Publication 3-59, 7 December 2012, "Meteorological and Oceanographic Operations"
- d. Joint Publication 3-0, 11 August 2011, "Joint Operations"
- e. DoDD 5100.01, 21 December 2010, "Functions of the Department of Defense and Its Major Components"
- f. CJCSI 3170.01 Series, "Joint Capabilities Integration and Development System"
- g. Title 10, United States Code, Chapter 5, 1 March 2012, "Joint Chiefs of Staff," Section 153
- h. CJCSM 3219.01 Series, "Interruption of Remote Sensing Space System Data Collection & Distribution during Periods of National Security Crisis"
- i. Joint Publication 3-13.1, 8 February 2012, "Electronic Warfare"
- j. CJCSI 3500.01, "Joint Training Policy and Guidance for the Armed Forces of the United States"
- k. Joint Publication 5-0, 11 August 2011, "Joint Operation Planning"

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GLOSSARY

METOC Forces and/or Personnel - Personnel trained to conduct meteorological, oceanographic, or space environmental operations. This does not imply individual personnel are capable of performing all three aspects of METOC operations.

METOC Information - Meteorological, climatological, oceanographic, hydrological and space environment observations, analyses, prognostic data or products, and meteorological and oceanographic effects.

METOC Operations - Characterizing the past, current, or future state of the meteorological, oceanographic, or space environment and/or exploiting that information.

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